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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,324	09/18/2003	Motomu Hashizume	TI-36027 / DDM03-020	6245

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EXAMINER	
FIGUEROA, NATALIA	
ART UNIT	PAPER NUMBER
2651	

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/665,324	HASHIZUME ET AL.	
	Examiner	Art Unit	
	Natalia Figueroa	2651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5,6,9,10,13 and 14* is/are rejected.

7)☒ Claim(s) *3,4,7,8,11,12,15 and 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 September 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *02/11/2005*.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 02 November 2005 (02/11/2005) is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

-For figure 2, applicant does not mention reference numerals "156, 177, 82, 256, and 277".

-In page 6 of the specification, reference numeral "152", is not shown in the figures.

-In page 9 of the specification, reference numerals "252, 254, 200, and 217", are not shown in the figures.

The examiner advises that all reference numerals be verified. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will

be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1-2, 5-6, 9-10, 13, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Voorman et al (USPN 5,668,676), hereinafter Voorman.

RE claim 1-2, Voorman discloses an apparatus for effecting symmetric driving of a write head (abstract and fig. 1); the apparatus comprising (a) a first drive unit coupled with a first connection locus of said write head (fig. 1 and disclosure thereof); (b) a second drive unit coupled with a second connection locus of said write head (fig. 1 and disclosure thereof); and (c) a control unit coupled with said first drive unit and said second drive unit (or in response to the information signal from a host system, fig. 1 and col. 1, lines 7-11); said control unit effecting complementary coordination by said first and second drive units to provide at least one drive signal in substantially equal magnitudes of opposite polarities at each of said first and second connection loci during respective time intervals of operation of said write head (abstract, fig. 1 and disclosure thereof, and col. 8, lines 15-26).

RE claim 2, Voorman further discloses that said first drive unit comprises at least one first current mirror structure and said second drive unit comprises at least one second current mirror structure substantially similarly with said at least one first current mirror structure (fig. 1,

and col. 7, line 66-col. 8, line 16), and wherein said at least one drive signal includes a direct current write current signal (col. 11, lines 33-45).

RE claims 5-6, Voorman further discloses that said respective time intervals of operation are intervals of a digital data signal (or in response to the information signal from a host system, fig. 1 and col. 1, lines 7-11).

RE claim 9, Voorman discloses an apparatus for driving a write head in response to at least one data signal (abstract and fig. 1); the apparatus comprising (a) a first drive unit coupled with said write head (fig. 1 and disclosure thereof); (b) a second drive unit coupled with said write head (fig. 1 and disclosure thereof); and (c) a control unit coupled with said first drive unit and said second drive unit; said control unit receiving said at least one data signal and generating control signals to said first drive unit and said second drive unit in response to said at least one data signal (or in response to the information signal from a host system, fig. 1 and col. 1, lines 7-11); said control signals controlling said first drive unit to apply at least one first drive signal to a first write head connection locus of said write head in a first signal polarity and controlling said second drive unit to apply at least one second drive signal to a second write head connection locus of said write head in a second signal polarity opposite to said first signal polarity when said at least one data signal effects a signal excursion; said at least one first drive signal and said at least one second drive signal being substantially equal in magnitude; said at least one first drive signal and said at least one second drive signal being applied substantially simultaneously (abstract, fig. 1 and disclosure thereof, and col. 8, lines 15-26).

RE claim 10, Voorman further discloses that said each of said first drive unit and said second drive unit are substantially similar in construction and comprise a first logic level current

mirror and a second logic level current mirror; each of said first and second logic level current mirror being coupled to receive a logic level write drive component signal and responding to said control signals to present a representative logic level write drive signal related to said logic level write drive component signal to said write head in one of said first signal polarity or said second signal polarity (fig. 1, and col. 7, line 66-col. 8, line 26).

RE claims 13 and 14, method claims 13 and 14 are drawn to the method of using the corresponding apparatus claimed in claims 9 and 10. Therefore method claims 13 and 14 correspond to apparatus claims 9 and 10 and are rejected for the same reasons of anticipation as used above.

Allowable Subject Matter

5. Claims 3-4, 7-8, 11-12, and 15-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

RE claim3-4, the prior art of record, and in particular Voorman (USPN 5,668,676) fails to teach or suggest an apparatus wherein said first drive unit comprises at least one first current mirror structure and said second drive unit comprises at least one second current mirror structure substantially similarly with said at least one first current mirror structure, and wherein said at least one drive signal includes a write boost current signal.

RE claims 11-12 and 15-16, the prior art of record, and in particular Voorman (USPN 5,668,676) fails to teach or suggest an apparatus and associated method comprising a first boost current mirror and a and second boost current mirror; each of said first and second boost current

mirror being coupled to receive a boost current write drive component signal; each respective boost current mirror of said first and second boost current mirror responding to said control signals to present said boost current write drive component signal to said write head in the same signal polarity of said first signal polarity or said second signal polarity as said representative direct current write drive signal presented by said respective current mirror.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following documents are cited to further show the state of the art with respect to write drivers.

a) Van Eaton et al (Pub. No.2004/0196581): Discloses a current mirror in a write driver.

b) Choi et al (USPN 6,927,933): Discloses a current mirror in a write driver.

c) Lacombe (USPN 6,496,317): Discloses a write current mirror in a write driver.

d) Ranmuthu (USPN 6,831,800): Discloses a boost system for a write driver.

e) Del Gatto et al (USPN 6,909,264): Discloses a current mirror in a write driver.

f) Contreras et al (USPN 5,296,975): Discloses a write driver.

g) Gooding et al (USPN 5,291,069): Discloses an H write driver.

h) Chiou et al (USPN 5,386,328): Discloses a current mirror in a write driver.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Natalia Figueroa whose telephone number is (571) 272-7554. The examiner can normally be reached on Monday - Thursday 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NFM

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